MODULE FOUR- QUALITY FUNCTION DEPLOYMENT (QFD)

LESSON ASSIGNMENT

Objectives:

- To introduce the student to the concept of a QFD matrix or house of quality.
- To explain how QFD matrices "cascade" and relate important customer attributes to design choices.

Desired Learning Outcomes: The student should be able to:

- Construct a product planning QFD matrix.
- Explain the importance of each "room" of a QFD.
- Understand how QFD can be used to define the problem.

Assignments/ References

Read: ***The House Of Quality***, John Hauser and Don Clausing, Harvard Business Review, May 1988

Chapter 4

WORKBOOK FOR MODULE FOUR

QUALITY FUNCTION DEPLOYMENT

Mr. Mark Gordon
National Center For Advanced Technologies

This chapter of the workbook consists of an exercise for constructing a QFD matrix, and a list of questions to be answered after viewing the videotape. To aid in constructing the QFD matrix, a blank format has been included at the end of this chapter. Feel free to use this format, or to draw your own matrix on a blank page. You might want to copy the form so that you can may changes later. This blank form was printed using the Windows program called "QFD Designer". If you plan an using QFD in your program, it is a good idea to get this or another QFD program.

STAGE TWO (End of Tape)

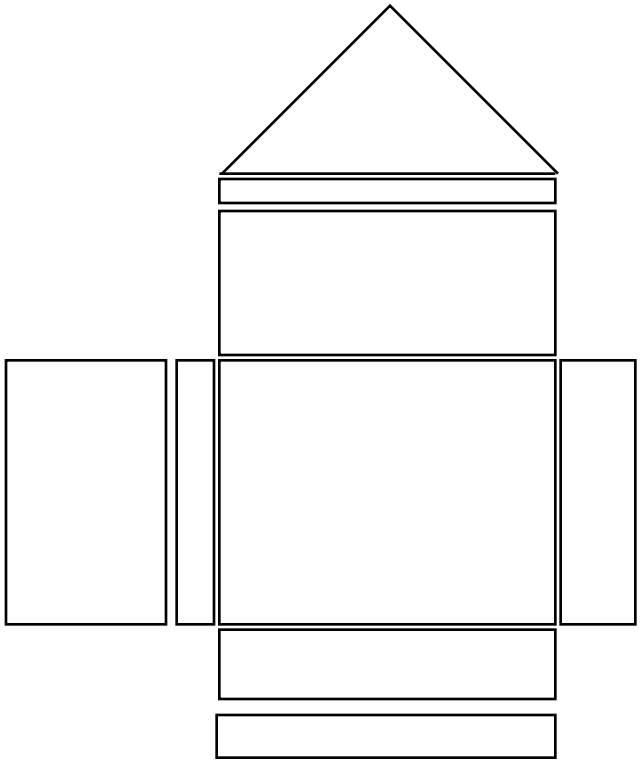
Q1. What is the objective of Quality Function Deployment?

Q2. Why would QFD be considered an implementation of Taguchi's definition of quality?

Q3. What would happen if one person filled out a QFD Matrix? Since everyone cannot be present for a QFD meeting, how do you make sure that all viewpoints are recorded?

Q4. Fill out the following chart with the proper names of the areas:

Quality Function Deployment Matrix



Q5. Why are general terms such as “Importance” and “Whats” and “Hows” used in the definition of QFD?

Q6. What can a blank column in a QFD relationship matrix mean to your product planning matrix?

Q7. What can a blank row in your product planning QFD relationship matrix mean to your design?

Q8. What does a crossing of the competitive assessment mean?

Q9. In the CAV product planning matrix, write the actual mathematical summation equation for the last column titled repairability that results in the absolute importance of 150.

Q10. Why can’t the absolute importance from QFD matrix be directly quoted as a reason for design decisions.

Exercise

QFD matrix

ANSWERS for Module Four

QUALITY FUNCTION DEPLOYMENT

Q1. What is the objective of Quality Function Deployment?

A1. The objective of QFD is to identify the most important issues based upon the customer's desires, and to understand the effect of product design decisions on downstream processes.

Q2. Why would QFD be considered an implementation of Taguchi's definition of quality?

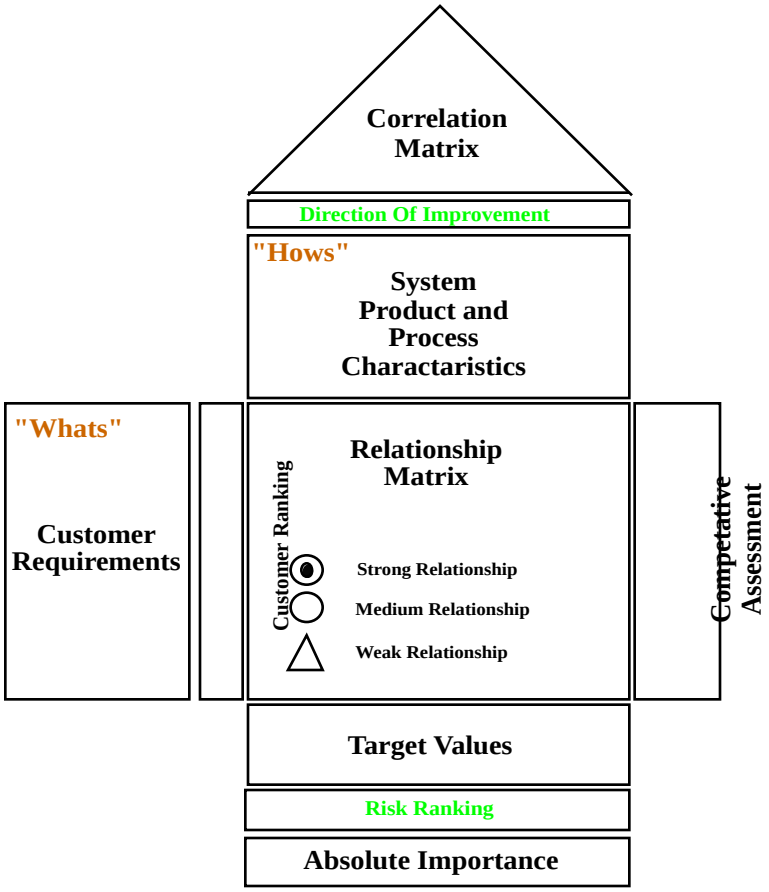
A2. Since Taguchi's definition of quality is meeting the customer's requirements with a minimum loss to society, QFD starts the process by capturing the voice of the customer. QFD helps to implement this quality view by relating all product and process characteristics to the customer's ranked requirements.

Q3. What would happen if one person filled out a QFD Matrix? Since everyone cannot be present for a QFD meeting, how do you make sure that all viewpoints are recorded?

A3. The QFD results would be slanted towards that person's priorities and interests. The customer's requirements would be ranked according to inherent biases, and the relationships would only be filled out according to their experience. If everyone is not present, their viewpoints can be recorded by providing a NON-ranked list customer requirements and a QFD without the relationships specified. After the first iteration, the QFD matrix should be circulated to all participants for a second opinion. The ability for everyone to understand the rooms of the QFD is critical for this process.

Q4. Fill out the following chart with the proper names of the areas:

A4.



Q5. Why are general terms such as “Importance” and “Whats” and “Hows” used in the definition of QFD?

A5. In the deployment of one QFD matrix to the next, the present “Hows” become the next “Whats”, and the Absolute Importance becomes the Ranking. Thus, these terms are generic in order to differentiate between the Function of the specific element of the matrix (what and how), and the Information in that room. Between different matrices, the Function is constant, but the Information switches location in the matrix.

Q6. What can a blank column in a QFD relationship matrix mean to your product planning matrix?

A6. A blank column means that one of your design characteristics has no relationship to the customer desires. Either this is a non-essential characteristic, or your customer requirements are incomplete.

Q7. What can a blank row in your product planning QFD relationship matrix mean to your design?

A7. A blank row shows that one customer requirement is not related to any of the design characteristics. Either the requirement will not be met, or a characteristic has been ignored.

Q8. What does a crossing of the competitive assessment mean?

A8. A crossing of the competitive assessment means that the system is rated below another benchmark system. Since the scale of the competitive assessment is such that a higher number is always better, a crossing shows a high risk area that might be a result of a design trade off.

Q9. In the CAV product planning matrix, write the actual mathematical summation equation for the last column titled repairability that results in the absolute importance of 150.

A9. The summation is as follows:

Importance = 5.0 x 1 + 4.0 x 1 + 3.0 x 1 + 4.0 x 9 + 4.0 x 9 + 4.0 x 3 + 4.0 x 3 + 3.0 x 9 + 5.0 x 9

= 5 + 4 + 3 + 36 + 36 + 12 + 12 +27 + 15

= 150

Q10. Why can't the absolute importance from QFD matrix be directly quoted as a reason for design decisions.

A10. Because the ranking of the customer requirements and the level of relationship in the matrix are both based upon the best estimate of the team members, the numeric importance value is only useful in relation to the other design characteristics in the matrix. That is why the best method of reporting QFD results is in a bar graph.